



DRAFT Revisions to the 2003 NSTA Standards for Science Teacher Preparation

Thank you for reviewing and providing feedback on the revised NSTA Standards for Science Teacher Preparation (NSSTP). These standards are for NSTA Program recognition in conjunction with or support of other accrediting bodies (NCATE, TEAC, or State Accreditation). These standards apply to programs that prepare science teacher educators at the middle and secondary level (undergraduate programs, post degree programs, Master's programs, and alternative certification programs). This vetting process is an important one as we continue to evolve the NSSTP. There is a link on the website: www.nsta.org/preservice for comments and feedback. As you consider the five standards, please keep in mind that our work was guided by the following:

- The revised Standards are for beginning science teachers are meant to represent minimal competencies.
- The revised Standards are designed so as to not replicate those competencies addressed and assessed under the NCATE Unit Standards.
- The revised Standards are designed to allow individual emphases within programs while maintaining a basic level of competency.
- The revised Standards adopts the Continuous Improvement model approach adopted by NCATE and assumes programs currently holding accreditation to be meeting the standards.

Members of the NSTA Preservice Subcommittee

Herb Brunkhorst

Kathy Norman

Erica Brownstein

Frances Eberle

David Wiley

Jon Pedersen

Elizabeth Allan

DRAFT Standards

NSTA Standard 1

- Effective teachers of science understand and demonstrate the knowledge and practices of contemporary science. They interrelate and interpret important concepts, ideas, and applications in their fields of licensure.

Below are the elements of the standard.

Preservice teachers will:

- 1a)** Demonstrate the major concepts, principles, theories, laws, and interrelationships of their fields of licensure and supporting fields as recommended by the National Science Teachers Association using the State Licensure Exam, Content Analysis

Form and an additional assessment (GPA or comprehensive content assessment).

- **Assessment:** *These elements are usually met using Assessment 1 and 2.*

NSTA Standard 2

- Effective teachers of science understand how students learn and develop scientific knowledge. Preservice teachers use various methods including scientific inquiry to develop this knowledge.

Below are the elements of the standard.

Preservice teachers will

- 2a)** Plan multiple lessons using a variety of inquiry approaches that demonstrate Preservice teachers' knowledge and understanding of how students learn science.
- 2b)** Include active inquiry lessons where students collect and interpret data in order to develop and communicate concepts and understand scientific processes, relationships and natural patterns from empirical experiences.
- 2c)** Develop Design formative and summative assessment strategies to achieve the appropriate learning goals.
- 2d)** Design instruction and assessment strategies that confront and address naïve concepts/preconceptions.

NSTA Standard 3

- Effective teachers of science develop an instructional unit plan that is consistent with the goals and recommendations of State and/or National Science Education Standards. Preservice teachers will plan a unit in a specific science discipline that includes the nature of science, inquiry, the social context of science, and safety. The unit includes the construction of fair, equitable, and effective assessment strategies that are designed to measure student learning.

- Below are the elements of the standard.

Preservice teachers will design a Unit of Study that:

- 3a)** Addresses the goals of State and/or National Science Education Standards which consists of multiple lesson plans.
- 3b)** Includes the nature of science, the social context of science, and safety. This must include all aspects of Standard 4a, b and c **2c)** Develop Design formative and summative assessment strategies to achieve the appropriate learning goals.
- 3c)** Includes scientific investigation through the inclusion of laboratories and/or field experiences.

- **Assessment:** *Standard 2 and 3 are usually met using Assessment 3—Unit Plan*

NSTA Standard 4

- Effective teachers of all science licensures are able to create a learning environment and learning experiences for all students that demonstrate chemical safety, safety procedures, and the ethical treatment of living organisms. Effective teachers of science can, in a P-12 classroom setting, demonstrate and maintain chemical safety, safety procedures, and the ethical treatment of living organisms needed in the P-12 science classroom

Below are the elements of the standard.

Preservice teachers will:

- 4a)** Understand safe and proper techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used within their subject area science instruction.
- 4b)** Understand emergency procedures, how to maintain safety equipment, and ensure the candidate has the knowledge of how to design safety procedures for the activities and abilities of students in the classroom, on the school grounds, and in the planning of field experiences.
- 4c)** Understand the proper treatment of all living organisms used in the classroom or found in the field in a safe, humane, and ethical manner and comply with legal restrictions on their collection, keeping, and use.
- 4d)** Practice in a P-12 classroom the safe and proper techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used within their subject area science instruction as applicable to licensure area and P-12 school setting.
- 4e)** Demonstrate in a P-12 classroom an ability to implement emergency procedures and maintenance of safety equipment, policies and procedures that comply with established state and/or national guidelines. Preservice teachers ensure safe science activities appropriate for the abilities of all students as applicable to licensure area and P-12 school setting.
- 4f)** Establish and practice in a P-12 classroom ethical decision-making with respect to the treatment of all living organisms in and out of the classroom. They emphasize safe, humane, and ethical treatment of animals and comply with the legal restrictions on the collection, keeping, and use of living organisms as applicable to licensure area and P-12 school setting.

Assessment: Elements 4a, 4b and, 4c are usually met using Assessment 4 – Student Teaching Observation for the Teaching of Science. Elements 4d, 4e, and 4f are usually met using Assessment 6, Safety Module

NSTA Standard 5

- Effective teachers of science provide evidence to show that P-12 students' understanding of major science concepts, principles, theories, and laws have changed as a result of instruction by the candidate and that student knowledge is at a level of understanding beyond memorization. Preservice teachers will collect, organize, analyze, and reflect on diagnostic, formative and summative evidence of learning.

Below are the elements of the standard.

Preservice teachers will collect, organize, analyze, and reflect on pre-, formative and summative evidence to demonstrate that preservice teachers will:

- 5a)** Engage P-12 students in developmentally appropriate inquiries that require them to develop concepts and relationships from their observations, data, and inferences.
- 5b)** Teach content for understanding.
- 5c)** Teach social context of science.
- 5d)** Teach students to distinguish science from other ways of knowing, and critically analyze assertions made in the name of science.

Assessment: *These elements are usually met using Assessment 5 – Evidence of Prek-12 student learning*